

Original Research

Sex Differences in Prevalence of Emergency Department Patient Substance Use



Robert D. Cannon, DO¹; Gillian A. Beauchamp, MD¹; Paige Roth, MSW¹; Jennifer Stephens, DO²; David B. Burmeister, DO¹; David M. Richardson, MD¹; Alanna M. Balbi, BS¹; Tennessee D. Park, BA¹; Stephen W. Dusza, DrPH¹; and Marna Rayl Greenberg, DO, MPH¹

¹Department of Emergency and Hospital Medicine, Lehigh Valley Hospital and Health Network/University of South Florida Morsani College of Medicine Allentown, Pennsylvania; and ²Department of Internal Medicine, Lehigh Valley Hospital and Health Network/University of South Florida Morsani College of Medicine Allentown, Pennsylvania

ABSTRACT

Purpose: Substance use and misuse is prevalent in emergency department (ED) populations. While the prevalence of substance use and misuse is reported, sex-specific trends in ED populations have not been documented. We set out to determine the sex-specific prevalence of ED patient substance use during this current epidemic.

Methods: A retrospective electronic data abstraction tool, developed for quality-improvement purposes, was used to assess ED visits in 3 hospitals in northeastern Pennsylvania. All patients with ED diagnosis codes for substance use F10.000 through F 19.999 (excluding F17 codes for nicotine) were abstracted for network ED visits at all 3 hospitals. Data points included ED clinical enrollment site, primary substance used, sex, date of ED visit, disposition (including left without being seen, left against medical advice, discharged, admitted, and treatment in rehabilitation) for 18 months (January 1, 2016 through July 31, 2017). The categorical parameters of sex, clinical enrollment site, diagnosis, date of ED visit, and disposition status were summarized as a proportion of the subject group. Time series analysis was used to assess trends in substance use and misuse visits by patient sex.

Findings: A total of 10,511 patients presented to the EDs during the study time period with a final diagnosis of a substance use-related reason and were included in the analysis. The mean age for these patients was 43.6 (SD 16.4) years, and the majority was male (65.6%, n = 6900). The most common substance in the final

diagnosis for the ED visit was alcohol (54.3%; 95% CI, 53.3–55.2), followed by opioids (19.2%; 95% CI, 18.4–19.9) and cannabis (14.4%; 95% CI, 13.7–15.0). Females tended to be younger than males (42.4 years vs 44.3 years; $P < 0.001$), and were more likely to be discharged after the ED visit than males (36.1% vs 32.3%; $P < 0.001$). When exploring differences in age by sex and substance, males with a final diagnosis including alcohol- and cannabis-related issues were older than females, whereas females diagnosed with opioid-related reasons were older than males (41.3 vs 38.9 years; $P < 0.001$).

Implications: There are sex-specific differences in prevalence of patients presenting with substance use in the ED setting. (*Clin Ther.* 2018;40:197–203) © 2018 Elsevier HS Journals, Inc. All rights reserved.

Key words: opioids, prevalence, sex differences, substance use.

INTRODUCTION

Substance use and misuse is prevalent in emergency department (ED) populations.^{1–4} ED patients are more likely than the general population to use and misuse substances.⁵ While tobacco and alcohol-related morbidity and mortality continue to be reported, more

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recently, specific attention has been brought to the opioid crisis in the United States.⁶ Of the 21.5 million Americans 12 years or older that had a substance use disorder in 2014, 1.9 million involved prescription pain relievers and 587,000 involved heroin.⁷ From 1999 through 2008, overdose death rates, sales, and substance use disorder treatment admissions related to prescription pain relievers increased in parallel—the overdose death rate in 2008 was nearly 4 times the rate in 1999, while sales of prescription pain relievers in 2010 were 4 times those in 1999—and the substance use disorder treatment admission rate in 2009 was 6 times the 1999 rate.⁸

Sex differences have been implicated as an important factor in the etiology, pathophysiology, sequelae, and treatment of substance use disorders.⁹ Specifically in the ED population, explorations of sex differences in substance use among adult emergency patients have illustrated that males have a higher prevalence of substance use, in particular, lifetime use of nonprescription opioids, as well as methadone or buprenorphine, are reported to be twice as high for males as females.⁹ Other sex-specific differences in opioid use are more concerning for females. Females are more likely to take prescription opioids without a prescription to cope with pain, even when they are reporting similar pain levels.¹⁰ Research also suggests that females are more likely to misuse prescription opioids to self-treat for other problems, such as anxiety or tension.¹¹

While the overall prevalence of substance use and misuse in the context of the current substance use epidemic has been reported, sex-specific trends in substance-related ED visits have been less well documented.⁹ We present the sex-specific prevalence in ED encounters during this current epidemic related to patient substance use.

PATIENTS AND METHODS

This study was approved by Lehigh Valley Health Network's Institutional Review Board using the expedited review procedure in accordance with regulatory requirements. Data on adult ED visits from 3 hospitals in northeastern Pennsylvania were abstracted using a tool that had been developed for hospital quality improvement. The contributing hospitals were an inner-city hospital with an annual census of more than 30,000 visits per year (site A), a

Level 1 trauma center with an annual census of 90,000 visits per year (site B), and a suburban hospital with an annual census of 58,000 visits per year (site C). All patients with *International Classification of Diseases, Tenth Revision*, ED final diagnosis code (s) for substance use F10.000 through F19.999 (excluding F17 codes for nicotine) were abstracted electronically by an automated query established by an information technologist using SAP BusinessObjects Web Intelligence (WebI; SAP.com) who was blinded to the study protocol for ED visits at all 3 hospitals. Data included ED clinical enrollment site, primary substance used, sex, date of ED visit, and disposition (including left without being seen, left against medical advice, discharged, admitted, and treated in rehabilitation) for 18 months (January 1, 2016 through July 31, 2017).

Descriptive statistics and graphical methods were used to assess the distribution of study variables by patient sex. Univariate analyses included Student *t* tests and Pearson χ^2 to assess differences in the distribution of study variables by patient sex. Exact 95% binomial CIs were calculated for the relative frequency estimates for each drug. Random effects regression was used to evaluate differences in age by substance (drug), controlling for disposition of patient from the ED. A random effect was added to these analyses because patient data were aggregated from 3 separate hospitals within the same health network. In addition, multinomial logistic regression was used to evaluate associations between ED disposition (coded as admitted, discharged, and other) and patient sex by substance type (coded on three levels: alcohol, opioids, and other). These analyses included assessments of the interaction between patient sex and substance type. Marginal predicted probabilities were estimated from these models and plotted to help better visualize the relationship between being admitted and substance type by patient sex. All regression models included patient age to control for potential confounding. Additionally, a time series analysis was completed to evaluate the overall counts and relative proportions of substances (drugs) encountered in the ED between January 1, 2016 and July 31, 2017, out of all the patients evaluated for drug-related issues. These analyses aggregated data per month and were stratified by patient sex. Linear tests for trend were performed to assess any trends in the data over the course of the evaluation time frame. All analyses were performed using STATA software, version 14.2 (Stata Corp, College Station, Texas).

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